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EXAMINER	
GREEN, RICHARD R	
ART UNIT	PAPER NUMBER
3644	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/582,700	EICHHOLZ ET AL.	
	Examiner	Art Unit	
	Richard R. Green	3644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 February 2009 and 02 March 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 4-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

The amendments to the specification and drawings of 2/24/2009 have been accepted.

Claim Objections

Claims **20 and 25** are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Parent claim 16 requires that fluid isolation be maintained between the air in the panels and the air in a cabin of the aircraft, however claims 20 and 25 require that the air be directed from the panels into the cabin or overboard; the claimed embodiment of venting into the cabin is capable of being infringed without infringing upon the parent claim.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims **16-25** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter

which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim **16** has the new limitation, "maintaining fluid isolation between the warm waste air and air in a cabin of the aircraft. To provide support for this limitation in the original Specification, Applicant cites in paragraph 37, "[a]t the end of the second hollow chambers 32 the now cooled down air flows out into the aircraft fuselage 10 [or] can be conveyed to the outside in a controlled manner." This passage does not clearly indicate that fluid isolation is maintained; at best it shows that the original Specification was indifferent to fluid isolation, at worst it teaches "the now cooled down air flows out into the aircraft fuselage 10", which is an embodiment at odds with fluid isolation between the two bodies of air. Certainly there is no support in the original disclosure for the claimed embodiments of claims **20 and 25** wherein fluid isolation is maintained despite intermixing the waste air and cabin air.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims **20 and 25** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim **20,** it is not clear how the fluid isolation of claim 16 is being maintained if the air is vented into the fuselage.

Regarding claim **25,** it is not clear how the fluid isolation of claim 16 is being maintained if the air is directed into the cabin after it has cooled; is this a separate part of the cabin? Is fluid isolation maintained until after the second hollow chambers? It is not clear.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims **1, 2, 9, 14-18, 24 and 25** are rejected under 35 U.S.C. 102(b) as being anticipated by USPN-4819720 to Howard.

Regarding claims **1, 16 and 18,** Howard teaches an aircraft (fig. 2) including avionics equipment (fig. 3, at 13) in an avionics bay (fig. 3, at 15), the aircraft also including:

a floor within the aircraft (fig. 3: specifically here considering the liner cover 39 to be a floor within the aircraft; regardless of whether it might support the weight of a person, it is a uniform covering for the lower portion of chamber 35) made up of heatable panels (col. 5, lines 26-33: the liner and envelope are segmented into smaller bays, appearing like panels in fig. 5) defining a plurality of first hollow chambers formed integrally within the panels (fig. 5, envelopes at 19) wherein each chamber has a first and second end (fig. 5, at 19); and

a feed line operatively connected to the first ends of the first hollow chambers and providing fluid communication between the avionics bay and the first ends of the first hollow chambers (fig. 3, at 39; alternatively at 21; both of these elements serve to provide fluid communication), the feed line supplying warm waste air to the hollow chambers, the warm waste air originating from the cooling of the electronic equipment contained in the avionics bay (fig. 3: air arriving from bay 15 feeds through the flooring 39; col. 4, lines 44-53);

in this system, fluid isolation is maintained between the air in the avionics cooling / floor heating circuit and air in a cabin (fig. 3, at 33) of the aircraft (fig. 3; abstract: "closed loop system").

Regarding claims **2 and 17,** the first hollow chambers of Howard extend in the longitudinally direction of the aircraft inside the panels (fig. 2), the warm waste air flowing longitudinally therethrough (at least to a degree).

Regarding claim **9,** the panels of Howard are thermally uncoupled from a structure which supports the floor (fig. 2: the landing gear support the aircraft, and by extension the floor, and are reasonably thermally uncoupled from the panels).

Regarding claim **14,** the panels of Howard are provided with thermal insulation on their lower side (fig. 6, the skin at 23 provides some degree of thermal insulation greater than zero).

Regarding claim **15,** the panels of Howard are profile elements (fig. 5; the limitation "produced by continuous extrusion" is a product-by-process limitation and the final structure of Howard is not critically materially distinct from the claimed structure).

Regarding claim **24,** a forced flow is generated in the hollow chambers of Howard (col. 4, lines 31-43, col. 5, lines 3-16; figs. 1, 3; fan at 17 generates a forced flow, as does the pressure in plenum 35).

Regarding claim **25,** the air from the first hollow chambers is directed back into the cabin after the warm waste air has cooled (fig. 3: the air returns up through the passenger cabin to the avionics bay after the warm waste air has cooled, the avionics bay being a sort of cabin of itself, though the system is closed loop and the air does not interact with the passenger cabin air).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims **1, 2, 4, 5, 9, 13-20, 24 and 25** are rejected under 35 U.S.C. 103(a) as being unpatentable over the C-130 as described in the EAWS document in view of USPN-6883590 to Messana and USPN-4819720 to Howard.

Regarding claims **1, 2, 4, 5, 9, 14-20, 24 and 25,** The C-130 Hercules (as taught by the EAWS document) is a cargo transport aircraft with an aft-cargo door/ramp (EAWS section 201.1.6 c) and a ducted underfloor heating system using hot air (201.1.7 c; this implicitly indicates that a forced flow is generated in hollow ducts of the floor); the C-130 also has an avionics bay containing electronic equipment (203.1+).

The EAWS document is silent on the precise configuration of the underfloor hot air ducting system, as well as the source of the hot air and any method to cool the included avionics equipment.

Messana teaches a modular heated panel system arrangeable in independent circuits, using a heated fluid medium (fig. 5), the system including:

heatable panels (fig. 5) defining first and second pluralities of hollow chambers (fig. 5: first hollow chambers are those pipes 3 of the left circuits; second hollow chambers are those pipes 3 of the right circuit, past the section VI; pipes 11 are also hollow chambers) wherein each chamber has a first and a second end (fig. 5); and

feed lines operatively connected to the first ends of the first and the second hollow chambers and providing fluid communication thereto from a heat source (fig. 5: feed lines 8; it can be seen that the right-hand heating circuit has its own feed line 8; col. 6, lines 17-21 indicate that these lines supply the heating fluid);

the hollow chambers extend in the longitudinal direction (the longest sections of the chambers do extend in the longitudinal axis of the panel arrangement, but they also extend in the cross-direction by their serpentine nature);

the cross sections of the feed lines determine the amount of fluid supplied (this is an inherent fact of pipe cross sections, in that fluid mass flow is defined by the function mass flow rate = density of the fluid * Velocity of the fluid * cross sectional Area of the pipe); and

the panels are profile elements (fig. 5) and are provided with thermal insulation on their lower side (fig. 6a, at 2).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to configure the heated floor ducting system of the C-130 in the manner of Messana, because the panels of Messana are quick to install and do not require specialized knowledge to install (Messana col. 2, lines 44-48). It would further have been obvious to a person of ordinary skill in the art at the time of the invention to arrange an independent heating circuit on the cargo ramp of the C-130 as well, to prevent icing and to provide even heating of the enclosed cargo area, and in so doing, one of the separate feed lines 11 would be directed toward heatable panels on the cargo door, in addition to the feed line already supplying heating fluid to the panels of the cargo bay floor. In so doing it would either be necessary or obvious for:

the hollow chambers to extend longitudinally (as previously stated, the chambers extend in both directions, however it would be more obvious to install the panels of Messana lengthwise, in which case the longest segments of piping 3 would of necessity align in the longitudinal direction);

the panels to be thermally uncoupled from a structure which supports the floor (the landing gear is distant enough from the floor to be thermally uncoupled, and supports the floor while the craft is on the ground); and

fluid isolation to be maintained between the heating fluid and air in a cabin of the aircraft (the circuits of Messana do not show a vent to ambient; at the very least fluid isolation is maintained until after the air passes through the panels, which is the same extent as Applicant's invention);

the heating fluid to pass from the panels of the floor to the panels of the door (fig. 5: hollow chambers 11 operatively fluidly connect the first set of panels to the next, and air flows from the second end of one set into the first end of the next); and

the second hollow chambers terminate into the aircraft fuselage (in that, there must be a last panel, and the pipint 11 must terminate at that point).

It is considered within the skill of one in the art to optimize the relative dimensions of the panels and embedded chambers for the usage of heated air as a specific heating fluid, though neither the EAWS document nor Messana teach the use of warm waste air from the cooling of aircraft electronic equipment as the heating fluid.

Howard teaches an avionics cooling system whereby air is used to cool avionics, and then vented to the floor of the aircraft to cool the air, using the ambient air as a heat sink (Howard fig. 3). It would have been obvious to a person of ordinary skill in the art at the time of the invention to cool the avionics of the C-130 in a fashion similar to that of Howard, only routing the air through channels in the panels of Messana and using the cabin air as a heat sink (the ambient air would also be a heat sink, at least indirectly, particularly for the panels on the cargo door), for the double purpose of cooling the avionics equipment and providing a heating fluid for the panels of the floor.

In so doing, the warm waste air would flow through the first panels of the floor, and then the second panels of the door (through piping 11 of Messana), and then back into the fuselage/cabin (insofar as the avionics bay is part of the fuselage/cabin).

Regarding claim **13,** in addition to the discussion above, it would have been obvious to a person of ordinary skill in the art at the time of the invention to include the

fan 17 of Howard (fig. 3) in the feed lines (either 8 or 11) of Messana (fig. 5) to provide a forced flow through the hollow chambers and ensure that sufficient heat exchange takes place.

Claims **6-8, 21 and 22** are rejected under 35 U.S.C. 103(a) as being unpatentable over EAWS in view of Messana and Howard as applied to claims 1, 16 and 19 above, and further in view of USPN-6058725 to Monfraix et al. (hereafter Monfraix).

Regarding claims **6-8, 21 and 22,** Messana and Howard are both silent on using hot engine bleed air to heat the floor; the C-130 may use hot engine bleed air to heat the floor, however the EAWS document is silent on this aspect; none of the documents teach using both warm waste air from the avionics in combination with hot engine bleed air.

Monfraix teaches a system of providing aircraft cabin temperature control using in part hot engine bleed air (col. 1, lines 5-10), but whereby a desired temperature of supplied air flow is achieved by mixing the bleed air with other air flows (col. 2, lines 13-16, 48-51; col. 8, lines 30-32; fig. 1), particularly adding direct hot bleed air when air of an intermediate temperature is insufficient to heat the desired area to a required temperature (col. 2, lines 48-51). It would have been obvious to a person of ordinary skill in the art at the time of the invention to use hot engine bleed air to supplement the warm waste air in the event that the warm waste air did not suffice to raise the temperature of the cabin to a desired level, as in Monfraix;

in so doing, hot engine bleed air would be supplied through the piping 8 and 11 of Messana, such that second ends of the first hollow chambers supply hot bleed air to the hollow chambers of the panels forming the floor of the cargo door of the C-130 via the second feed line (see Messana fig. 5, particularly if it takes more than one panel to cover the floor of the cargo door); since each panel has its own feed line, but every feed line passes through the earlier panels, a new source of hot bleed air mixed with warm waste air arrives at every panel in turn, after having passed through the previous panels, but not having passed through the serpentine portion of the previous panels.

The limitations of claim 8 have already been addressed; it is an inherent physical fact that cross sectional area determines the mass flow of a fluid passing through a pipe.

Claims **10-13 and 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over EAWS in view of Messana and Howard as applied to claims 1 and 16 above, and further in view of US-2002/0056787 to Wilson, Jr. et al. (hereafter Wilson).

Regarding claims **10-12 and 23,** EAWS, Messana and Howard are silent on electric heating. Wilson teaches an aircraft supplemental electric air heater, to be installed inline with a hot air supply duct, downstream of a fan (figs. 1, 2 and 6; heater at 10 and 110, fan at 118), which is meant to contribute additional heat to an existing hot air heating system for portions of the floor which are not sufficiently heated, such as areas near the doors (paragraph 3). The heating element of Wilson is electric (paragraph 5), and may comprise a heating coil (paragraph 6). It would have been obvious to a person of ordinary skill in the art at the time of the invention to install the

supplemental electric heater of Wilson in the hollow chambers (either 8 or 11; particularly 8, for superior control of which panels receive supplementary heat, such as only those near doors) of the panels of Messana installed in the aircraft of EAWS in view of Messana and Howard, to supplement the warm waste air for colder portions of the floor. Once installed, this air heater would provide:

electric heating mats for supplementary heating (the coiled composite may loosely be considered a heating mat, since it provides heat and is essentially flat, though coiled), positioned on the lower side of the panels (positioned below the top layer: see Messana fig. 3; the piping is located on the lower side of the layer 1, and the supplemental heater will be located in such a position), and the heating coil would be integrated into the hollow chambers (being inline).

Regarding claim **13,** in addition to the discussion above regarding claims 10-12 and 23, it would have been obvious to a person of ordinary skill in the art at the time of the invention to include the fan 118 of Wilson with the inline heater to assist the air past the heater, since its presence constricts the cross sectional area of the pipe, and once included a ventilator would be positioned in the first hollow chambers to generate a forced flow.

Response to Arguments

Applicant's arguments with respect to claims **1, 2 and 4-25** have been considered but are moot in view of the new ground(s) of rejection.

The amendments to claims **1, 12 and 22** have repaired the errors under 35 USC 112, and the previous rejections have been withdrawn.

Applicant's arguments, see page 14, third paragraph, filed 2/24/2009, with respect to claim 7 have been fully considered and are persuasive. The rejection of the claim under 35 USC 112, first paragraph of 10/28/2008 has been withdrawn.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard R. Green whose telephone number is (571)270-5380. The examiner can normally be reached on Monday - Thursday 8:00 am - 6:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Mansen can be reached on (571)272-6608. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. R. G./
Examiner, Art Unit 3644

/Timothy D. Collins/
Primary Examiner, Art Unit 3643
For Michael Mansen